

NOTES ON SOME SAWFLY LARVAE BELONGING TO THE GENUS DIMORPHOPTERYX.

By WILLIAM MIDDLETON.

Of the Bureau of Entomology, United States Department of Agriculture.

The following account, which is a contribution from the Branch of Forests Insects, Bureau of Entomology, deals with the known larvae of the sawflies belonging to the genus *Dimorphopteryx*, and has been prepared under the writer's direction by Mr. Middleton, who was assigned to assist in the rearing of Forest Hymenoptera. It has been Mr. Middleton's duty to make notes and care for the rearing material of the species of this genus, and for this reason he has been requested to work over the notes available and prepare them for publication to follow a synopsis of the adults. Special attention has been paid to the specific differences in the larvae at hand, to add additional proof as to the validity of the species founded on adult characters. Brief statements describing the type of work, the time of appearance of the larvae, and methods of pupation have been added, to aid collectors and to convey an idea of the seasonal history of these insects.—*S. A. Rohwer.*

GENUS DIMORPHOPTERYX.

Characters of immature stages common to species studied.

Egg.—The egg of one species has been described by Doctor Dyar, and the egg-laying habits of the other species are no doubt similar.

"[Eggs deposited] under the upper epidermis [of leaf] in an irregularly elliptical area [approximately] 1.7 mm. by 1.4 mm., transparent, overlaid by the reticulations of the epidermal cells. Before hatching the larva swells up somewhat and a ring of air forms around it, appearing like a white margin." Dyar, Journ. N. Y. Ent. Soc., vol. 5, 1897, p. 199.

The following characters of the larva, prepupa, and cocoon are common to all of the species studied.

Larva.—Shape sluglike, not slimy; many distinct annulations; skin dull, finely granular. Head higher (dorsad-ventrad) than broad; eyes in dark spots; antennae 5-jointed. Thorax: The lateral or pleural folds lobed and tuberculate; legs 4-jointed, the fourth joint modified into a claw. Abdomen: Intermediate segments

6-annulate (fig. 1); pleural fold lobed and tuberculate; prolegs somewhat reduced, on segments 6-12 and anal; anal segment with a pair of subanal protuberances (they are subdorsal and basad of the anal plate); plate armed apically with 4 spines, the median ones called the subdorsal pair, the lateral ones, the lateral.

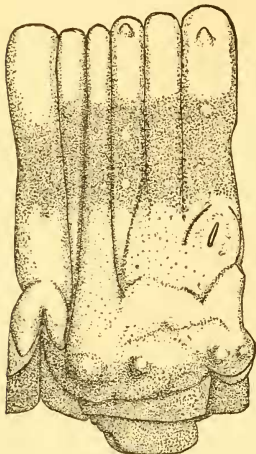


FIG. 1.—LATERAL VIEW OF SEVENTH (THIRD ABDOMINAL) SEGMENT OF DIMORPHOPTERYX CASTANEAE.

Prepupa.—Similar to larva, though more concolorous. Head pale and more nearly round than that of larva, being somewhat depressed. Thorax: Pleural fold not distinctly lobed and not tuberculate; prothoracic and mesothoracic protuberances present but much reduced. Abdomen: Pleural fold not distinctly lobed and not tuberculate; pair of subanal protuberances nearly obsolete; armature of apical plate much reduced, becoming tuberculate.

Cocoon.—No cocoon is spun; pupation occurs in a capsule-shaped cell in soil. The size of cell is approximately 7 mm. long by 2.5 mm. in diameter.

Synopsis of the larvae studied.

Head dorsally prominent and conelike, considerably blackened at apex (see fig. 2); prothoracic and mesothoracic protuberances concolorous, pale yellowish. Host: *Castanea dentata*.....*castaneae* Rohwer

Head rounded, not prominent and conelike, darkened but faintly at apex (fig. 3); prothoracic protuberances whitish or slightly darkened, mesothoracic protuberance black. Host: *Quercus* species.....1.

1. Prothoracic protuberances slightly darkened, projecting from whitish portion of segment; lateral anal spines nearer to subdorsal spine than subdorsal spines are to each other (fig. 4); emargination between subdorsal spines U shaped, emargination between lateral and subdorsal spines V shaped. Host: *Quercus rubra*.

.....*autumnalis* Rohwer

Prothoracic protuberances whitish, projecting from faintly darker, subdorsal lines; subdorsal anal spines closer together than to lateral spine; emargination between the subdorsal spines sharply V shaped, between lateral and subdorsal, sub-U-shaped. Host: *Quercus rubra*.....*quercivora* Rohwer

DIMORPHOPTERYX CASTANEAE Rohwer.

Plate 28.

Host.—*Castanea dentata*.

Larva.—All the stages have been determined from the study of a single larva but additional characters from other larvae examined have been incorporated.

Stage I.—Length, 4.5 mm.; prothoracic width, 0.875 mm.; head, 0.875 mm. high (dorsad-ventrad length) by 0.5 mm. broad, below

eyes brown; top black capped; mandibles brown; thoracic protuberances present, mesothoracic one slightly smaller than prothoracic pair; dull golden yellowish green, alimentary canal colored dark olive green; subdorsal anal spines black tipped.

Stage II.—Length, 5.5 mm.; prothoracic width, 1 mm.; head, 1 mm. high by 0.67 mm. broad; general appearance same as first stage.

Stage III.—Length, 8 mm.; prothoracic width, 1.25 mm.; head, 1.33 mm. high by 0.875 mm. broad; general appearance the same.

Stage IV.—Length, 9.5 mm.; prothoracic width, 1.5 mm.; head, 1.67 mm. high by 1.13 mm. broad; general appearance the same.

Stage V.—Length, 10.5 mm.; prothoracic width, 1.75 mm.; head, 2 mm. high by 1.5 mm. broad; general appearance the same.

Stage VI.—Length, 15 mm.; prothoracic width, 2.33 mm.; head, 2.5 mm. high by 2 mm. broad, otherwise the same; prothoracic protuberances large and prominent, twice as high as thick; mesotho-

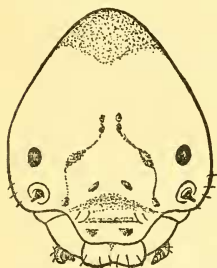


FIG. 2.—ANTERIOR ASPECT OF HEAD OF DIMORPHOPTERYX CASTANEAE.

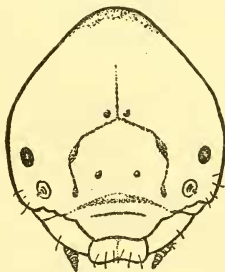


FIG. 3.—ANTERIOR ASPECT OF HEAD OF DIMORPHOPTERYX AUTUMNALIS.

racic protuberance slightly smaller; pleural region and anal plate bright (not shiny) yellow; dorsum (alimentary canal) dark green and separated from yellowish pleural region by blackish lateral lines running posteriorly from base of each yellowish prothoracic protuberance, to and including the large pair of white-tipped subanal protuberances, where they meet in a transverse band; anal spines black.

Stage VII.—(Prepupa). Length, 11.5 mm.; prothoracic width, 2.5 mm.; head, 2 mm. high by 2 mm. broad, dark above, not black, pale below antennae and about mouth, antennae dark, mandibles brownish; armature of anal plate reduced to tubercles, subdorsal pair as widely separated as in sixth stage, but united basally with the nearest lateral tubercle; skin yellow; spiracles slightly darkened in undarkened pleural band.

Remarks.—The larvae of this sawfly, in the first three stages, feed upon the upper epidermis and parenchyma of the chestnut leaves, but from the fourth to the sixth they characterize their work by

eating holes through the leaves.¹ They appear in the latter part of July and disappear in the latter part of September. The larvae average about 5 days a moult, the last feeding stage being the longer. Upon becoming prepupae the larvae cease to feed, but crawl about, seeking a favorable hibernating place. The adults emerge in early summer the following year, May 30 to about June 10, in the rearing cages.

Material of this species from the following localities has been studied: Falls Church and Wiehle, Virginia; and Blythedale, Maryland.

DIMORPHOPTERYX AUTUMNALIS Rohwer.

Host.—*Quercus rubra*.

Larva.—Younger stages are characterized from shed skins; the more advanced stages from one larva with additions from another.

Stage I.—Head, 0.875 mm. high by 0.5 mm. broad.

Stage II.—Head, 1 mm. high by 0.67 mm. broad.

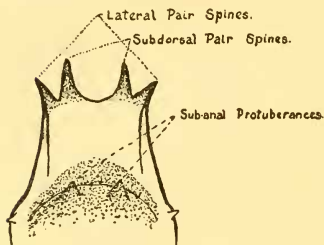


FIG. 4.—DORSAL VIEW OF ARMATURE OF APICAL SEGMENT OF DIMORPHOPTERYX AUTUMNALIS.

Stage III.—Head, 1.33 mm. high by 0.875 mm. broad.

Stage IV.—Head, 1.67 mm. high by 1.13 mm. broad.

Stage V.—Length, 11.5 mm.; prothoracic width 2 mm.; head 2 mm. high by 1.5 mm. broad; prothoracic protuberances prominent, higher than thick basally; mesothoracic protuberance low and rounded; subanal pair protuberances sharply pointed, high as

basal width, approximate emargination between V-shaped; anal spines long and sharp, 4 times as long as basal width; head uniformly rufo-ferruginous; dorsum, dark bluish green, sharply separated from paler pleural region and sternum but not with black lines; tip of mesothoracic protuberance, anal spines, subanal protuberances and basal area of anal plate black, being the only black portions on larva; legs testaceous.

Stage VI.—Head, 2.5 mm. high by 2 mm. broad; anal spines subequal in length; body red, dorsum darker and with a pair of darker red subdorsal lines; prothorax and protuberances pale red; anterior annulation of mesothorax and its protuberance black; small tubercles on pleural fold, white; anal spines black.

Stage VII.—(Prepupa). Length (alcoholic specimen), 7 mm.; head, 2.5 mm. high by 2.25 mm. broad; apical armature of anal plate reduced to four rounded humps; subanal protuberances present

¹ Similar work is often caused by the feeding of nymphs of long horn grasshoppers of the genus *Scudderis* (determined Caudell).

but small; body red; dorsum somewhat darker; feet pallid; head pinkish, slightly darkened dorsally.

Remarks.—The larvae of this sawfly are, in the summer, green, but with the reddening of the leaf petioles they become reddish. They feed similarly to the chestnut species, the younger larvae eating only the upper epidermis and parenchyma, the more advanced eating holes through the leaves. The prepupa never feeds, but crawls around in search of a suitable place for pupation. The larvae appear about the middle of August and usually enter the ground during early October. The adults emerge during early June of the following year, in rearing cages.

Material of this species has been collected at Falls Church and Wiehle, Virginia.

DIMORPHOPTERYX QUERCIVORA Rohwer.

Host.—*Quercus rubra*.

Larva.—The only description available is that made by Mr. S. A. Rohwer in the field, September 9, 1912, at Tomahawk Lake, Wisconsin. Prothoracic proturbances separated basally by their length; body reddish; dark reddish black, dorsal line very faint; head red with faint indication of small dorsal black spot.

Remarks.—Very little is known of the larvae of this species. The material was found in advanced stages eating holes through leaves and, becoming prepupae, disappeared into the ground in the latter part of September. The adults emerged in breeding cages late in June of the following year.

The field observations on this species were made at Tomahawk Lake, Wisconsin, while the rearing was done at Falls Church, Virginia.

DIMORPHOPTERYX ERRANS Rohwer.

Host.—Birch and linden (teste Dyar).

Egg.—Laid in nearly circular saw cuts under the upper epidermis in the middle of the leaf.¹

Larva.—The I-II, and IV-VII stages of larvae were described by Dyar,¹ but under heading I?, II?, III-VI. See correction,² which may not refer to this species, but is sufficient to establish the error in the naming of the stages.

EXPLANATION OF PLATE 28.

Dorsal view of living fifth or sixth stage larva and work of *Dimorphopteryx castaneae* Rohwer.

¹ Dyar, Trans. Amer. Ent. Soc., vol. 22, 1895, p. 311.

² Journ. N. Y. Ent. Soc., vol. 5, 1897, p. 199.